

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

0 296 728
A3

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 88305067.6

(51) Int. Cl. 4: B60T 10/02

(22) Date of filing: 03.06.88

(30) Priority: 23.06.87 US 65350

(43) Date of publication of application:
28.12.88 Bulletin 88/52(84) Designated Contracting States:
BE CH DE FR GB IT LI NL SE(88) Date of deferred publication of the search report:
27.12.89 Bulletin 89/52(71) Applicant: GENERAL MOTORS CORPORATION
General Motors Building 3044 West Grand
Boulevard
Detroit Michigan 48202(US)(72) Inventor: Fuehrer, Reece R.
51 North 200 East
Danville Indiana 46122(US)
Inventor: Won, Harvey Donald
786 Winter Court
Carmel Indiana 46032(US)(74) Representative: Denton, Michael John et al
Patent Section - Luton Office (F6) Vauxhall
Motors Limited P.O. Box 3 Kimpton Road
Luton Bedfordshire LU2 0SY(GB)

(54) Control circuit for vehicle retardation.

(57) A control circuit for vehicle retardation has a hydraulic retarder (26) and a slipping friction brake (14) operating in concert to retard the forward motion of the vehicle. The hydraulic retarder is an output driven device which is operable to absorb increasing energy as the vehicle speed increases. The friction brake is normally a ratio control reaction brake for the lowest forward drive ratio of the vehicle transmission. The friction brake has an additional apply piston (84,86) which is operable to slippingly engage the friction brake whenever the hydraulic retarder is operable and the vehicle transmission is not in the lowest forward ratio. The control circuit has a control valve (52) which is operable to control the engagement pressure of the additional piston in a manner such that the friction braking effort is higher at low vehicle speeds. This compensates for the lower effectiveness of the output driven hydraulic retarder. The control circuit is also effective to control the operation of the hydraulic retarder, the main piston of the reaction brake, cooling flow to the friction brake and cooling flow from the hydraulic retarder.

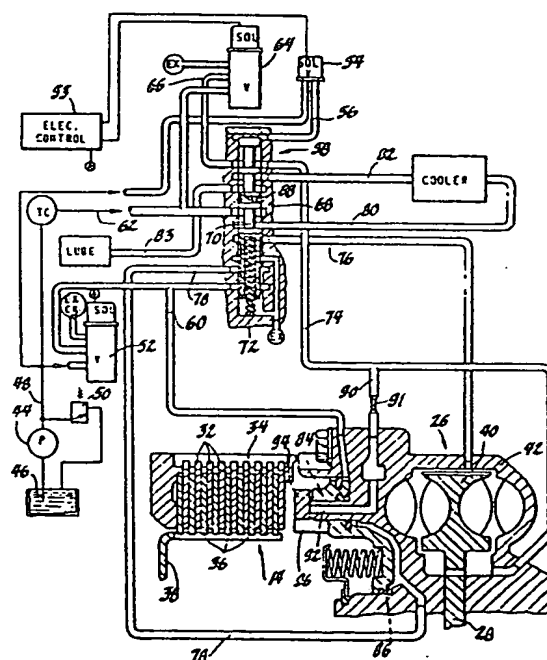


Fig. 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 30 5067

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	GB-A-2 022 743 (GENERAL MOTORS) * figures 1-10 * ---	1	B 60 T 10/02
A	GB-A-2 052 658 (GENERAL MOTORS) * figures 1-10 * ---	1	
A	US-A-4 480 728 (K. A. BAILEY et al.) * figures 1-5 * ---	1	
D,A	US-A-4 070 927 (J. C. POLAK) ---		
D,A	US-A-4 630 507 (A. KUGLER et al.) -----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 60 T F 16 D
Place of search		Date of completion of the search	Examiner
BERLIN		06-10-1989	LUDWIG H J
CATEGORY OF CITED DOCUMENTS			
<div><div>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</div><div>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document</div></div>			